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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,423	10/24/2005	Peter Andrin	DC8507 US PCT 1	3310
<div>7590 09/06/2007 Thomas W Gorman E I Du Pont De Nemours and Company Legal Patent Records Center 4417 Lancaster Pike Wilmington, DE 19805</div>			<div>EXAMINER LAIOS, MARIA J</div> <div>ART UNIT 1753</div> <div>PAPER NUMBER</div> <div>MAIL DATE 09/06/2007</div> <div>DELIVERY MODE PAPER</div>	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/550,423

Applicant(s)

ANDRIN, PETER

Examiner

Maria J. Laios

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 12-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 12-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>18 September 2006</u> .                                       | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 12 and 13, applicant states "maleic anhydride modified polymer with the thermoplastic polymer, partially fluorinated polymers and liquid crystalline polymer or mixtures thereof," but in claim 4 applicants states, "a thermoplastic polymer selected from the group consisting of melt processible polymers, partially fluorinated polymers, thermoplastic elastomers, liquid crystalline polymers, polyolefins, polyamides, aromatic condensation polymers, and mixtures thereof." It appears to the examiner that the applicant is using thermoplastic polymer as a group in claim 4 but then is using the term thermoplastic polymer as a species in claims 12 and 13.

### *Double Patenting*

3. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

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4. Claims 1, 2 and 18-21 provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 39-44 of copending Application No. 10/550422. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented. This is a provisional patenting rejection because the conflicting claims have not in fact been patented. The scope of the two sets of claims is identical.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1- 4, 14-17 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Davis (GB 2 326 017 A).

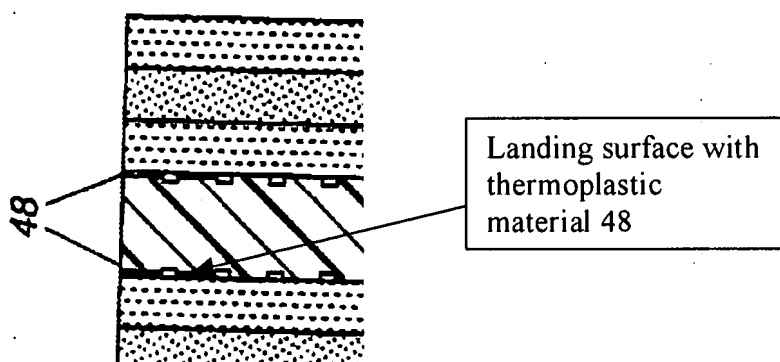
With regard to claims 1, 4 and 14, Davis discloses an electrochemical cell component comprising a gas diffusion layer comprising a porous body (page 1 lines 30-31, the electrodes are porous) and an electroconductive separator plate comprising at least one landing surface (37, grooves and figure 3) formed on the surface of the separator/bipolar plate, and the separator plate and landing surface comprising a polymer/thermal plastic (page 5 lines 9 discloses the thermal plastic as polyamides) and conductive filler (Page 4 lines 33, carbon fiber or carbon powder) wherein the gas diffusion layer is joined to the separator plate by impregnating some of the polymer on the

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landing surface within a portion of the porous body (page 6 lines 6-8, as the bipolar plate becomes heated it will fuse within the porous electrode).

With regard to claim 2, Davis discloses the gas diffusion layer is joined to the separator plate by heat lamination (page 6, lines 6-8).

With regard to claim 15-17, Davis discloses a thermoplastic bipolar with a thin layer of thermoplastic material/polymer rich material (48, polyethylene or polypropylene) on top of the landing surface (Figure 4, shown below). Since the thermoplastic material is disclosed as polyethylene or polypropylene it is polymer rich at 100 weight percent polymer.



With regard to claim 19, Davis disclose the surface of the separator plate comprises open flow field channels (37, grooves) and the gas diffusion layer does not sink into the open flow field channels (Page 6 lines 20-21).

With regard to claims 20 and 21, Davis discloses the component of claim 1 in a fuel cell assembly to form a stack (Figure 3, abstract).

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3 and 18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Davis (GB 2 326 017 A).

With regard to claim 3, Davis discloses the cell component as discussed above and incorporated herein, but fails to mention the method of joining the plate and diffusion/electrode layer by resistance welding. However the product by process limitation of claim 3 is not given patentable weight in a product claim.

With respect to claim 18, the electrochemical cell component of Davis inherently has a resistivity less than a resistivity of a system comprising a gas diffusion layer that is not welded to the separator.

9. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (GB 2 326 017) in view of Takagi et al. (US 7,008,991 B2).

With regard to claim 12 and 13, Davis discloses the component as discussed above in claim 4 and incorporated herein but fails to disclose a blend of 1 to 30 or 5 to 25 weight percent of maleic anhydride modified polymer with a liquid crystalline polymer. Takagi et al. discloses a thermoplastic resin composition with a composition of Component A, which is a thermoplastic

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resin such as styrene-maleic anhydride copolymer (col. 2 lines 26 and 27, styrene-maleic anhydride copolymer (col. 3 lines 14-36), Component B is a liquid crystal thermoplastic (col. 2 lines 46-47, col. 6 lines 23-26) and Components C and D are conductive carbon black (col. 8 lines 12-17) which can be molded for materials that require conductivity (col. 10 lines 43-46). The amount of component A with respect to component B affects the mechanical strength and moldability (col. 9 lines 7-27). The amount of component A is 5-65 parts by weight and component B is 95 to 35 parts in 100 parts by weight of the two thermoplastic resins combined (col. 9 lines 15-20). Takagi does not disclose the specific range of 1-30 weight percent. Davis and Takagi are analogous art because both are from the same problem solving area of using a molded resin compound for electrical conduction.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the polymer composition of Takagi in the fuel cell separator of Davis because the polymer compound of Takagi is suitable for molded components requiring excellent conductivity and strength. See MPEP 2144.07. See *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). The use of the resin for bipolar plate is a case of prima facie obviousness. *In re Sinclair*, 325 U.S. 327, 65 USPQ 297 (1945).

It would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the percentages of the two thermoplastic components (maleic anhydride polymer and liquid crystalline polymer) of Takagi through routine experimentation as the weight ratios affect mechanical strength and moldability. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly

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rebutts the prima facie case of obviousness. *See In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). The use of the resin for bipolar plate is a case of prima facie obviousness. *In re Sinclair*, 325 U.S. 327, 65 USPQ 297 (1945).

10. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (GB 2 326 017 A) in view of Koji et al. (JP 2002-275373).

Davis is relied upon as discussed above. However Davis fails to disclose a blend of 1 to 30 or 5 to 25 weight percent of maleic anhydride modified polymer with the thermoplastic polymer.

Koji discloses a resin for use as a separator/bipolar plate in a fuel cell with the composition of 7-25 parts weight of diamine (a polyamine, which is a thermoplastic polymer) and 5-22 part weight of maleic acid (the maleic acid would be about 4 to 15 weight percent) and 100 parts weight of electroconductive filler in order to provide a bipolar plate with excellent mechanical strengths, high electroconductivity and small specific volume resistivity (Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the resin of Koji in place the resin composition for the separator of Davis in order to provide a bipolar plate with excellent mechanical strengths, high electroconductivity and small specific volume resistivity.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria J. Laios whose telephone number is 571-272-9808. The examiner can normally be reached on Monday - Thursday 9:30 - 6:30.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJL



**SUSYTSANG-FOSTER  
PRIMARY EXAMINER**